



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/622,212

07/18/2003

Ramaprasad Samudrala

42P17400

4007

8791 7590 04/16/2007
BLAKELY SOKOLOFF TAYLOR & ZAFMAN
12400 WILSHIRE BOULEVARD
SEVENTH FLOOR
LOS ANGELES, CA 90025-1030

EXAMINER

BURROWES, LAWRENCE J

ART UNIT

PAPER NUMBER

2616

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
--	-----------	---------------

3 MONTHS

04/16/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/622,212

Applicant(s)

SAMUDRALA ET AL.

Examiner

LAWRENCE J. BURROWES

Art Unit

2616

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>7/18/2003 & 1/14/2005</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

1. Claims 1 and 22 are objected to because of the following informalities:

In claim 1 line 1, the recitation of "comprising" should end with a colon, it is suggested applicant change to ---comprising:---. Similar problem exists in claim 22 line

1.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-3, 5-10, 12-17 and 19-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Hughes (6,185,222).

For claims 1-3, 5-10, 12-17 and 19-21, Hughes disclose a device and method comprising: a plurality of ports to transmit data to and receive data from external sources (see Figure 8 Box 310 and 315, the ports transmit and receive data), wherein the ports operate at asymmetric speeds (see column 4 lines 18-20, the asymmetric switch includes the ports which also are asymmetric); a switching matrix to provide selective connectivity between the ports (see Figure 3 Box 305, the switch is connected to the port modules); and a plurality of channels to

connect the ports to the switching matrix (see column 4 lines 5-17), wherein number of channels associated with each port is determined by speed of the port (see column 3 lines 56-64, coupled lines can increase throughput);

a scheduler to select connectivity between the ports and to configure the switching matrix accordingly (see column 6 lines 14-30, the central arbiter controls the port selection and switch matrix) and configures the switching matrix to connect the channels associated with an incoming port to the channels associate with a corresponding outgoing port (see column 6 lines 1-30, the arbiter will determine which ports need to be connected in order to combat contention);

wherein at least some subset of the plurality of ports send requests to the scheduler; and the scheduler performs attribution of the requests to select connectivity (see column 5 lines 66-67 and column 6 lines 1-30, the arbiter logic performs tasks associated with selecting ports to avoid contention);

wherein the scheduler configures the switching matrix to connect inactive incoming ports to inactive outgoing ports (see column 6 lines 1-13, the arbiter can have packets delivered to other ports which would be inactive since an active port would contend with an active port);

wherein the scheduler configures the switching matrix to connect inactive incoming channels to inactive outgoing channels (see column 6 lines 1-13, the arbiter can have packets delivered to other channels which would be inactive since an active channel would contend with an active channel);

Art Unit: 2616

wherein the scheduler determines logical port connections and translates them to physical port locations (see column 6 lines 1-13, the arbiter controls how packets are linked to the port modules which have physical connectors);

wherein data is transferred between an incoming port and a corresponding outgoing port at speed of the slower of the incoming port and the corresponding outgoing port (see column 3 lines 56-64, the input can be a fraction of the output throughput by the variable k); and

wherein number of channels connected together to transfer data between the incoming port and the corresponding outgoing port is number of channels associated with the slower of the incoming port and the corresponding outgoing port (see column 3 lines 56-64, the input lines can be a fraction of the output lines throughput by the variable k).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

Art Unit: 2616

2. Ascertaining the differences between the prior art and the claims at issue.
 3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
6. Claims 4, 18 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hughes in view of Ash et al (5,130,982) hereafter Ash.

Hughes disclose all the limitations of the claimed invention except the scheduler connects all the channels associated with a first port to a subset of the channels associated with a second port, if the first port is operating at a lower speed than the second port.

Ash from the same or similar fields of endeavor teaches the scheduler connects all the channels associated with a first port to a subset of the channels associated with a second port, if the first port is operating at a lower speed than the second port (see column 1 lines 67-68 and column 2 lines 1-21, bandwidth to the linked nodes is dynamically allocated to the channels which can be a single channel or a group of channels in the communication link).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify/implement the channel grouping of Ash into the asymmetric switch of Hughes by programming the scheduler logic to combine channels with dynamic bandwidth. The motivation to do so would be so that the nodes connected to the switch would have on demand bandwidth therefore increasing the quality of service and efficiency of the switch.

7. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hughes in view of Isoyama et al (6,810,038) hereafter Isoyama.

For claim 11, Hughes disclose all of the limitation of the claimed invention except the scheduler including a request processor to process requests for permission to transmit data received from at least some subset of the sources (see Figure 12 Box 61, processes the requests from the ports; a schedule engine to determine requests to be accepted (see Figure 12 Box 65, the allocation block selects and informs the grant generator if accepted); a grant generator to generate grants for the sources that had requests accepted (see Figure 12 Box 66, the grant generator informs the ports if they are granted permission); and a configurator to instruct switching matrix to connect channels associated with a source to channels associated with a destination based on the grants (see Figure 12 Box 66, the grant generator also informs the switch of what channels to connect).

Isoyama from the same or similar fields of endeavor teaches the scheduler including a request processor to process requests for permission to transmit data received from at least some subset of the sources (see Figure 12 Box 61, processes the requests from the ports; a schedule engine to determine requests to be accepted (see Figure 12 Box 65, the allocation block selects and informs the grant generator if accepted); a grant generator to generate grants for the sources that had requests accepted (see Figure 12 Box 66, the grant generator informs the ports if they are granted permission); and a configurator to instruct switching matrix to connect channels associated with a source to

channels associated with a destination based on the grants (see Figure 12 Box 66, the grant generator also informs the switch of what channels to connect).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify/implement the scheduler of Isoyama into the asymmetric switching device of Hughes by replacing the arbiter box of Hughes with the scheduler box of Isoyama. The motivation to do so would be so that the quality of service in the switching device would be increased and specific aspects of the switch can be controlled with constraints set by the designer.

8. Claims 22, 23, 25-28 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hughes in view of Crowther et al (5,751,710) hereafter Crowther.

For claims 22, 23, 25-28 and 30, Hughes disclose all the limitation of the claimed invention except a plurality of Ethernet cards performing the same functions as explained in claim 1 and an electrical backplane with a plurality of channels performing the same function as explained in claim 1.

Crowther from the same or similar fields of endeavor teaches using a plurality of Ethernet cards that receive and transmit data and an electrical backplane which is connected to the switch matrix (see column 4 lines 35-69, the backplane bus which is electrical is an asymmetric mesh connected to the cards).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify/implement the Ethernet cards and the

backplane of Crowther into the switching device of Hughes by replace the port modules with Ethernet port modules and connecting the backplane between the switch matrix and the ports. The motivation for doing so would be so that the single point failures can be eliminated.

9. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hughes in view of Crowther, in further view of Isoyama.

For claim 11, Hughes in view of Crowther disclose all of the limitation of the claimed invention except the scheduler including a request processor to process requests for permission to transmit data received from at least some subset of the sources (see Figure 12 Box 61, processes the requests from the ports; a schedule engine to determine requests to be accepted (see Figure 12 Box 65, the allocation block selects and informs the grant generator if accepted); a grant generator to generate grants for the sources that had requests accepted (see Figure 12 Box 66, the grant generator informs the ports if they are granted permission); and a configurator to instruct switching matrix to connect channels associated with a source to channels associated with a destination based on the grants (see Figure 12 Box 66, the grant generator also informs the switch of what channels to connect).

Isoyama from the same or similar fields of endeavor teaches the scheduler including a request processor to process requests for permission to transmit data received from at least some subset of the sources (see Figure 12

Box 61, processes the requests from the ports; a schedule engine to determine requests to be accepted (see Figure 12 Box 65, the allocation block selects and informs the grant generator if accepted); a grant generator to generate grants for the sources that had requests accepted (see Figure 12 Box 66, the grant generator informs the ports if they are granted permission); and a configurator to instruct switching matrix to connect channels associated with a source to channels associated with a destination based on the grants (see Figure 12 Box 66, the grant generator also informs the switch of what channels to connect).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify/implement the scheduler of Isoyama into the combined device of Hughes in view of Crowther by replacing the arbiter box of Hughes in view of Crowther with the scheduler box of Isoyama. The motivation to do so would be so that the quality of service in the switching device would be increased and specific aspects of the switch can be controlled with constraints set by the designer.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Reches (2002/0110086), Lyles et al (5590123), Saxe (5631908), Orrell et al (7170854), Lee et al (2004/0085979), Dooley et al (7072350), Hoping et al (6487171), Wang et al (6826160) and Lund et al (5517495).

Art Unit: 2616

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to LAWRENCE J. BURROWES whose telephone number is (571) 270-1419. The examiner can normally be reached on Monday - Thursday 8am - 2pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wing F. Chan can be reached on (571) 272-7493. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

LJB



Seema S. Rao
SEEMA S. RAO 4/12/07
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2000